NetBurner

SB72EX User's Manual

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Overview of the SB72EX Dual-port Serial to Ethernet Device

The NetBurner SB72EX Dual-port Serial to Ethernet device comes preprogrammed and ready to run on your network. The SB72EX is programmed to convert RS-232, RS-422, RS-485, and TTL data to Ethernet, enabling communication with your serial device over a network or on the Internet. The onboard web server provides easy device configuration using a standard web browser.

Front view of the SB72EX, showing the power input jack, power-on LED, and the Ethernet RJ-45 connector.

Rear view of the SB72EX, showing the two RS-232 (default configuration) serial ports. Port 0 is on the left; Port 1 is on the right.

Configuration

Before you can begin using your SB72EX, three areas of configuration are required:

1. Hardware configuration
2. Network configuration
3. Operational configuration

You will need to tell your SB72EX what type of serial interface you want to use, the network address you want your SB72EX to respond to, the serial data baud rate, and the TCP/IP listening port number.

Hardware Configuration

The SB72EX has two asynchronous UART type serial ports, referred to as Port 0 and Port 1. They are accessed through two DB-9 connectors. Port 0 can be configured for either RS-232 or RS-485 operation (the factory default is RS-232), while Port 1 is **permanently** configured as a RS-232 port.

Note: The default setting (where both Port 0 and Port 1 are RS-232 ports) is appropriate for most implementations.

If your application requires a **single RS-232** connection, then you can use Port 1 (permanently configured as a RS-232 port), and skip this section because your SB72EX is already configured.

If your application requires **two RS-232** connections, the default setting (Port 0 and Port 1are both RS-232) will work, and you can skip this section because your SB72EX is already configured.

If your application requires a **single RS-422/485** connection, then you can configure Port 0 using the settings below.

To configure Port 0 as RS-422/485, you will need to open up your SB72EX case and change the position of the five jumpers. (**Note:** Please take proper ESD precautions. Failure to do so will **void** your NetBurner Standard Hardware Warranty.)

There are five 3-pin headers that can be jumpered in one of two positions: connecting pins 1 and 2, **or** connecting pins 2 and 3. The five jumpers are located on the SB72EX board as shown below. **Remember**, Port 1 is **permanently** configured as a RS-232 port.

- To configure Port 0 as **RS-485**: Position each of the five jumpers so they **connect pins 2 and 3**.

- To configure Port 0 as **RS-232** (the default configuration): Position each of the five jumpers so they **connect pins 1 and 2**.

After you have your SB72EX configured correctly, you **must** select the corresponding software options using the web interface.

Network Configuration

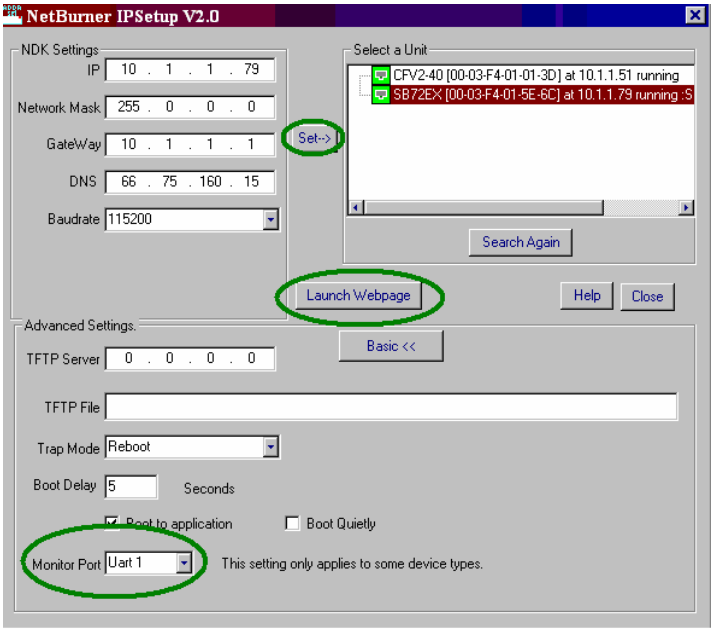
The Hardware configuration steps described above **must** be completed correctly **before** the software configuration can take place.

1. Run IPSetup.exe (by double clicking its icon). This program is located on the CD-ROM that came with your SB72EX. To view the Advance Settings, click on the **Advanced** button (the button name will change to **Basic**). In this example, I am using Uart 1 as my Monitor port (screen shot below).

2. Locate your SB72EX in the "Select a Unit" pane by matching its MAC address. The MAC address is located on the bottom of your SB72EX. If your SB72EX device does **not** appear in the list box, verify the power, speed, and link LEDs are illuminated, and click the **Search Again** button. If you are still unable to see your SB72EX, remove power, correct any cabling errors, reapply power, and click the **Search Again** button. **Note:** IP Setup uses a UDP broadcast protocol similar to BOOTP and will **not** operate through a router.

3. If your network supports DHCP (factory default): The assigned IP Address **will** appear in the "Select a Unit" pane. Write down this address. If your network does **not** support DHCP, configure the IP Address and Network Mask fields as shown in the screen shot below. If you need help selecting values, please read the "Selecting an IP Address" section at the end of this guide. After you have

entered all of your values, click the **Set** button in the center of the IP Setup window to configure your SB72EX with its new parameters. **Note:** If you do **not** click the **Set** button, your values will **not** be saved. If you have multiple NetBurner devices, make sure you selected your SB72EX in the "Select a Unit" pane (as shown in the screen shot) **before** you input your information.

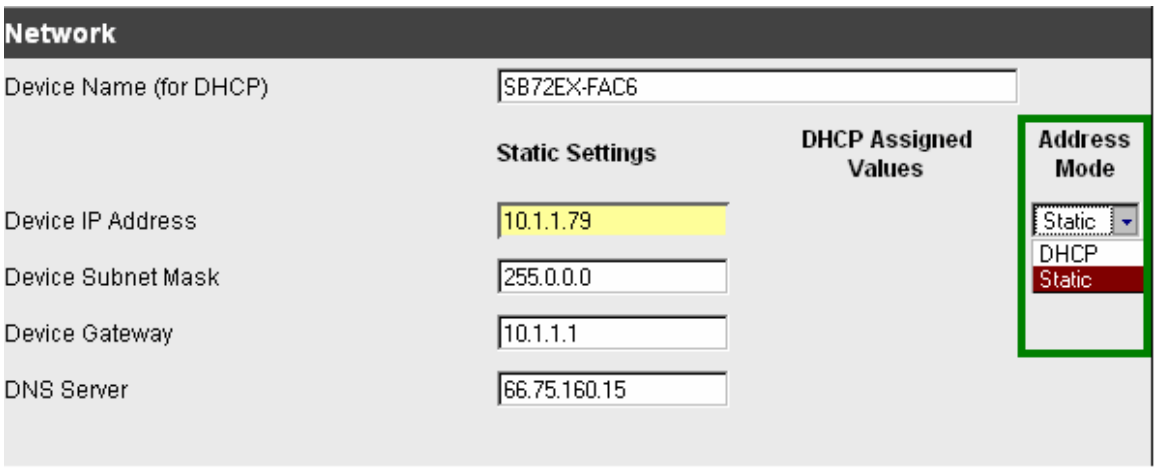

NetBurner IPSetup V2.0
NDK Settings
IP 10 . 1 . 1 . 79
Network Mask 255 . 0 . 0 . 0
GateWay 10 . 1 . 1 . 1
DNS 66 . 75 . 160 . 15
Baudrate 115200
Set-->
Select a Unit
CFV2-40 [00-03-F4-01-01-3D] at 10.1.1.51 running
SB72EX [00-03-F4-01-5E-6C] at 10.1.1.79 running :S
Search Again
Launch Webpage
Help
Close
Advanced Settings
Basic <<
TFTP Server 0 . 0 . 0 . 0
TFTP File
Trap Mode Reboot
Boot Delay 5 Seconds
Boot to application
Boot Quietly
Monitor Port Uart 1
This setting only applies to some device types.

Operational Configuration

Once the network parameters have been configured, you can use the web server interface to modify the settings of your SB72EX. To access the web page on your SB72EX, click on the **Launch Webpage** button in IP Setup, or you can open your web browser, and enter the numeric IP Address in the address field (e.g. http://10.1.1.79). **Note:** For the telnet example on page 19, I have set UART 1 as my Monitor Port.

Network Settings

Below is a screen shot of the top section of the first page that you will see when your web browser opens.

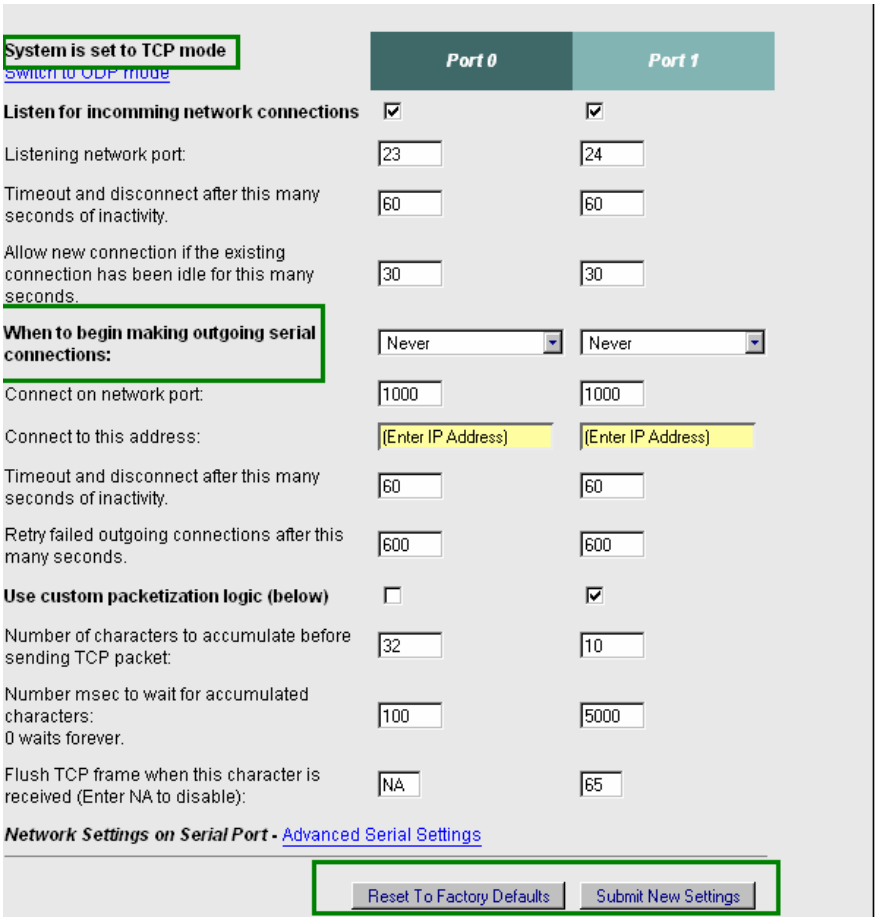


Parameter	Description
Device Name (for DHCP)	Your NetBurner SB72EX device. **Note:** The last four values (in the default name) are the last four digits of the MAC address of your SB72EX.
Device IP Address	Displays the IP Address of your SB72EX device. There are two choices: • If **DHCP** (from the "Address Mode" drop down menu) is selected, the SB72EX will obtain its IP Address information automatically, including the Subnet Mask, Gateway, and DNS Server (if applicable). This is the factory default. • If **Static** is selected (from the "Address Mode" drop down menu, as shown), you will **need** to supply the Static IP Address in the edit text box as shown in the screen shot above.
Device Subnet Mask	If you are using a Static IP Address, enter your IP Subnet mask in this text box as shown in the example above.
Device Gateway	If you are using a Static IP Address, enter the IP Address of your Gateway in this text box as shown in the example above.
DNS Server	If you are using a Static IP Address, enter the IP Address of your DNS Server in this text box as shown in the example above.

Remember to click the **Submit New Settings** button on the bottom of this page to **save** your settings. If you want the **restore** your SB72EX to its factory settings (DHCP), click the **Reset To Factory Defaults** button.

Device Connection Settings (TCP mode)

This is the bottom section of the first page that you will see when your web browser opens.

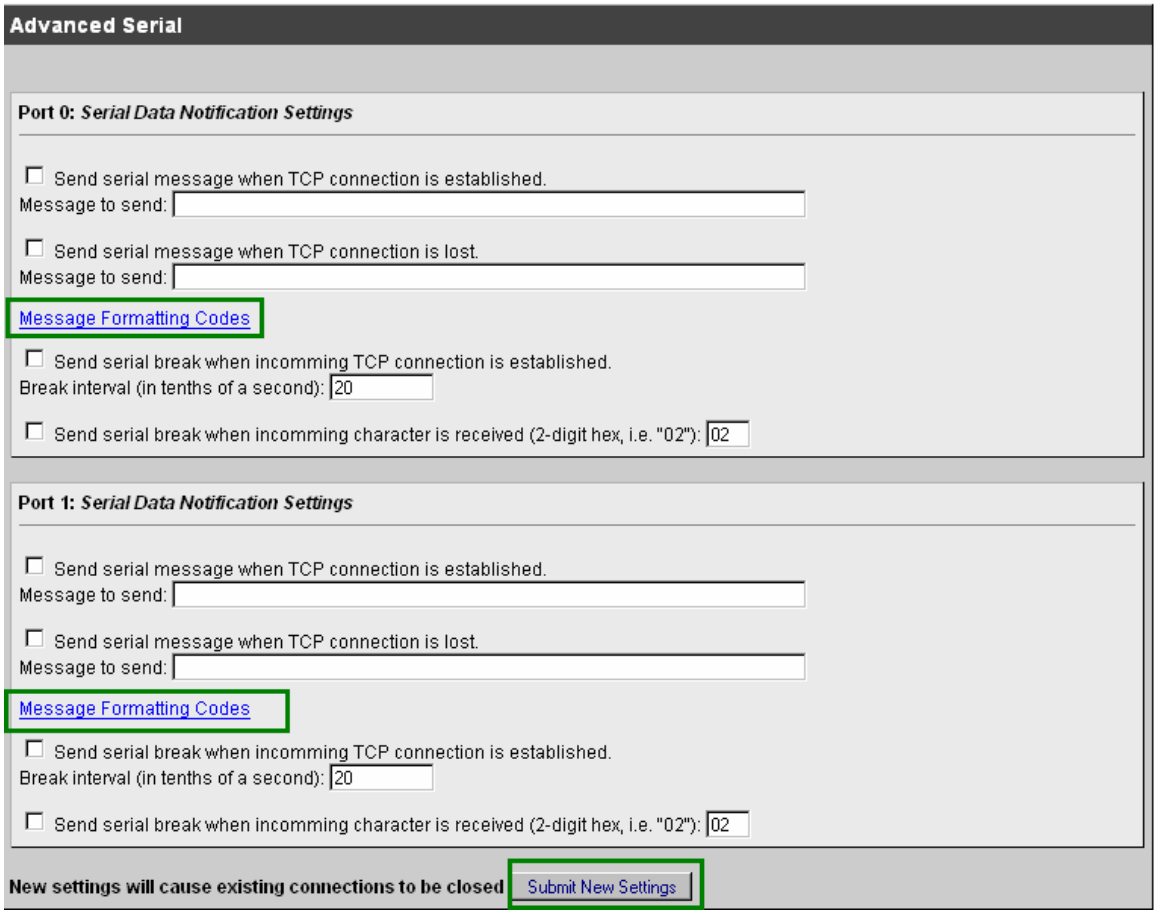


Your choices (for Port 0 and Port 1) for "**When to begin making outgoing serial connections**:" are:

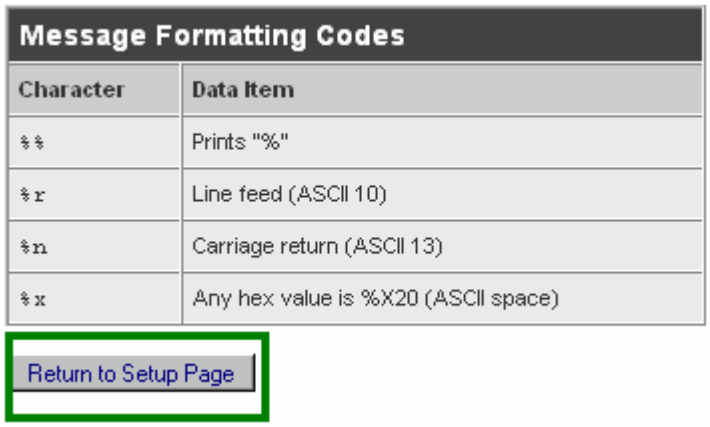
When you are finished with this section, click the appropriate button at the bottom of the page. **Submit New Settings** will **save** your settings, and **Reset to Factory Defaults** will restore the factory values. Next, click on the **Advanced Serial Settings** link to enter your serial notification information. **Remember**, if you are only using one port, you can ignore the other port's section. **Note:** For the telnet example on page 19, the **Listening network port** number for Port 1 is **24** (the default setting).

To view the **Advanced Serial Settings** screen click on its link on the bottom of this page.

Advanced Serial Data Port Settings (for both Port 0 and Port 1)


Advanced Serial
Port 0: Serial Data Notification Settings
Send serial message when TCP connection is established.
Message to send:
Send serial message when TCP connection is lost.
Message to send:
Message Formatting Codes
Send serial break when incomming TCP connection is established.
Break interval (in tenths of a second): 20
Send serial break when incomming character is received (2-digit hex, i.e. "02"): 02
Port 1: Serial Data Notification Settings
Send serial message when TCP connection is established.
Message to send:
Send serial message when TCP connection is lost.
Message to send:
Message Formatting Codes
Send serial break when incomming TCP connection is established.
Break interval (in tenths of a second): 20
Send serial break when incomming character is received (2-digit hex, i.e. "02"): 02
New settings will cause existing connections to be closed
Submit New Settings

If you want to have a message displayed in the MTTTY window (or HyperTerminal) when your TCP connection (e.g. telnet) is established or lost, enter it in this section. **Remember** to check the appropriate box and click the **Submit New Settings** button to save your settings. The message formatting codes are listed below.



Message Formatting Codes

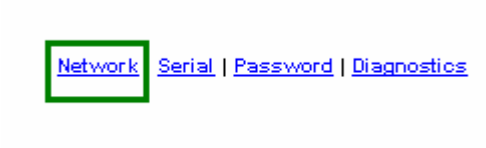
Character	Data Item
%%	Prints "%"
%r	Line feed (ASCII 10)
%n	Carriage return (ASCII 13)
%x	Any hex value is %X20 (ASCII space)

Return to Setup Page

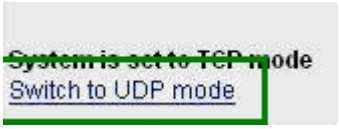
When finished viewing message formatting codes, click the **Return to Setup Page** button to return to your **Advanced Serial** web page. **Note:** If you are only using one port, you can ignore the other port's section.

Device Connection Settings (UDP mode)

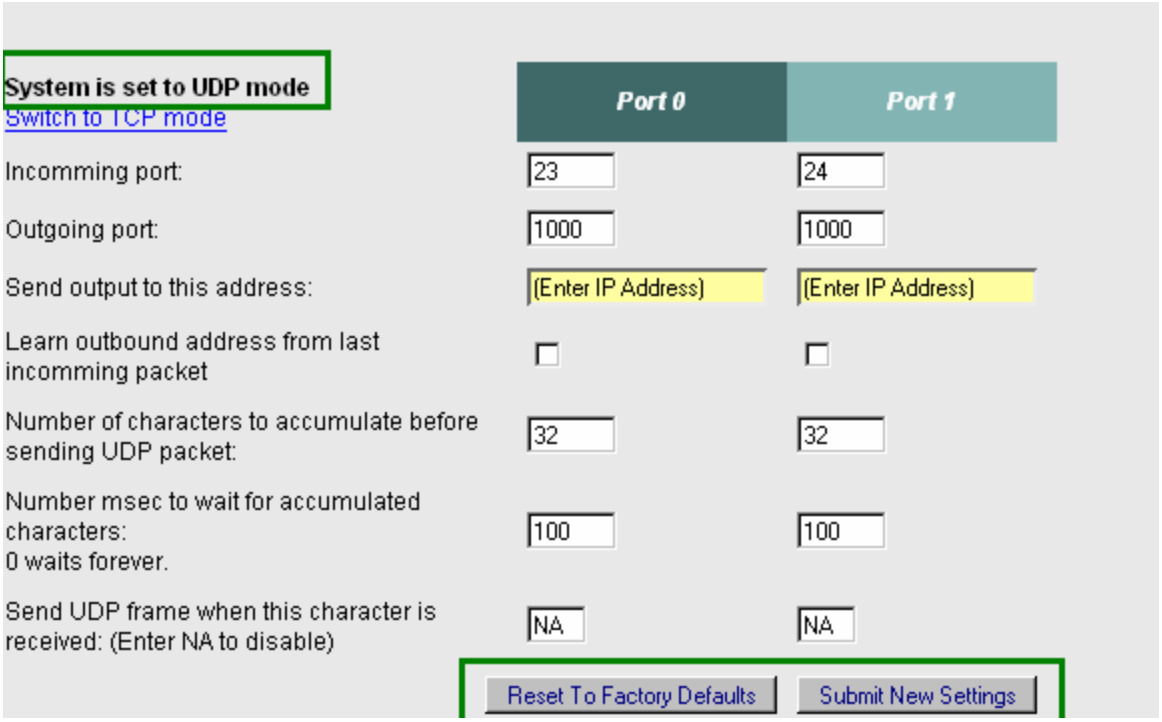
Return to the Network section by clicking on the **Network** link directly above the Advanced Serial section.



Click on the **Switch to UDP mode** link,(directly under your SB72EX settings) to go to the UDP section.



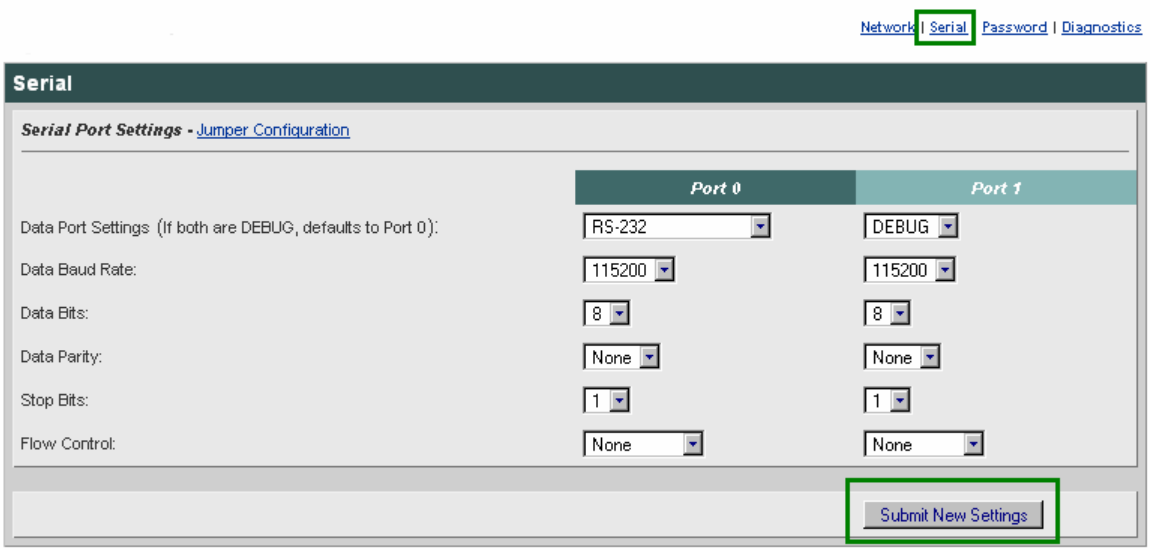
You will see "System is set to UDP mode" after you click the **Switch to UDP mode** link



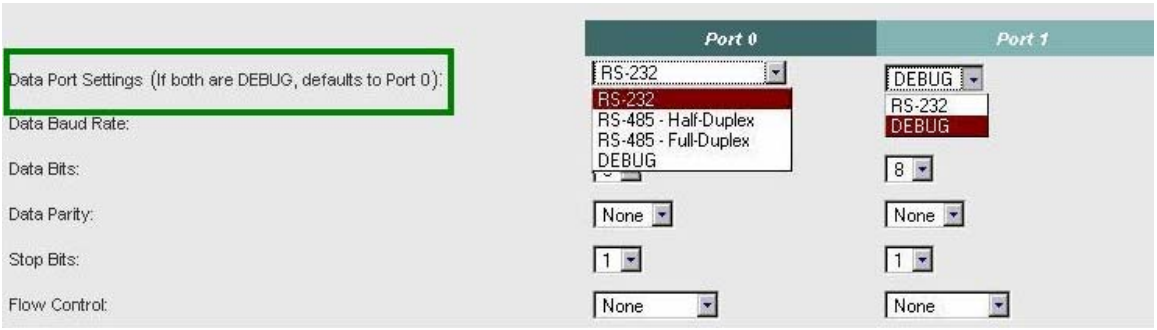
When you are finished with this section, click the appropriate button at the bottom. **Submit New Settings** will save your settings, and **Reset to Factory Defaults** will restore the factory values. Enter your valid destination IP address as a numeric address separated by periods. **Remember**, if you are only using one port, you can ignore the other port's section.

Serial Configuration (for Port 0 and Port 1)

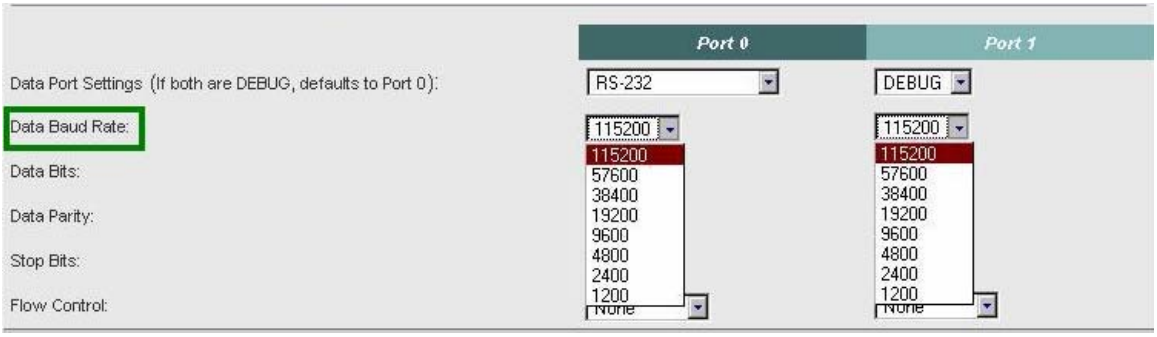
Click the **Serial** link at the top of the page to view the Serial page. When you are finished, **remember** to click the **Submit New Settings** button to save your changes. **Note:** If you are only using one port, you can ignore the other port's section.



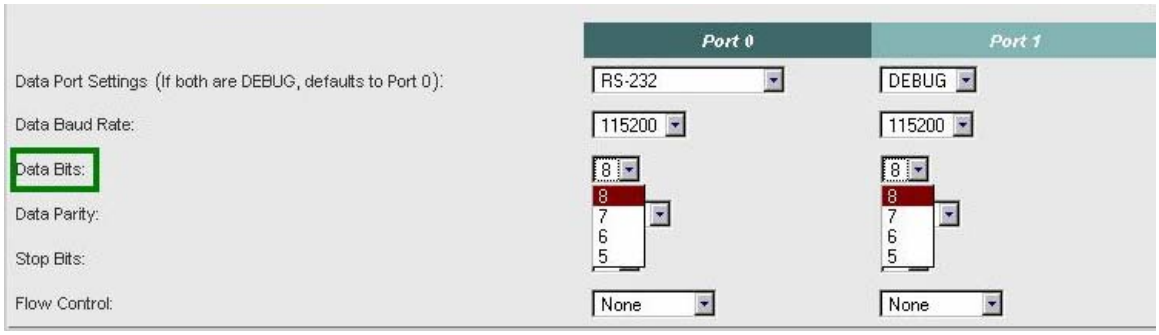
Select the appropriate **Data Port Setting** from the drop down menu. **Remember**, Port 1 is **permanently** configured as a RS-232 port.



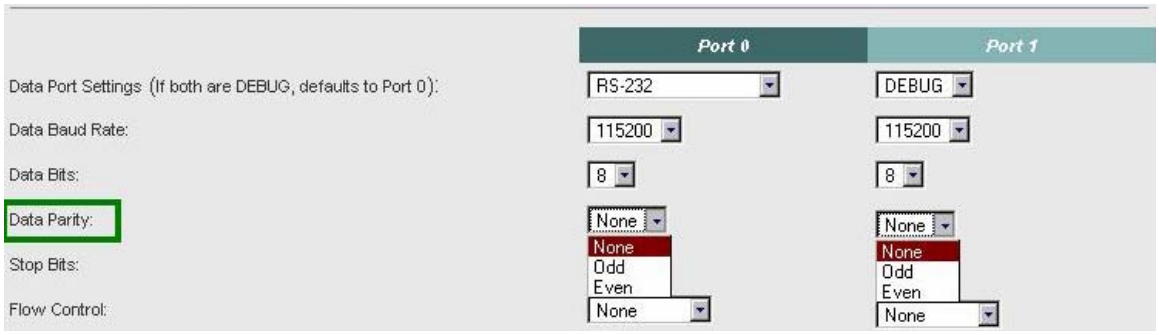
Select the appropriate **Data Baud Rate** from the drop down menu. Your host computer and your attached SB72EX **must** agree on a speed or baud rate to use for the serial connection. The factory default is **115200**.



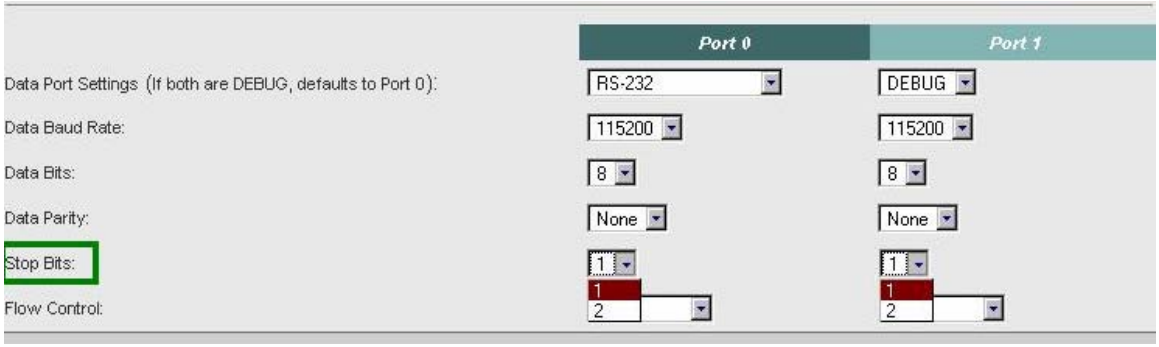
Select the appropriate **Data Bits** value from the drop down menu. The data bits are the number of bits in a transmitted data package (the recommended setting is **8**).



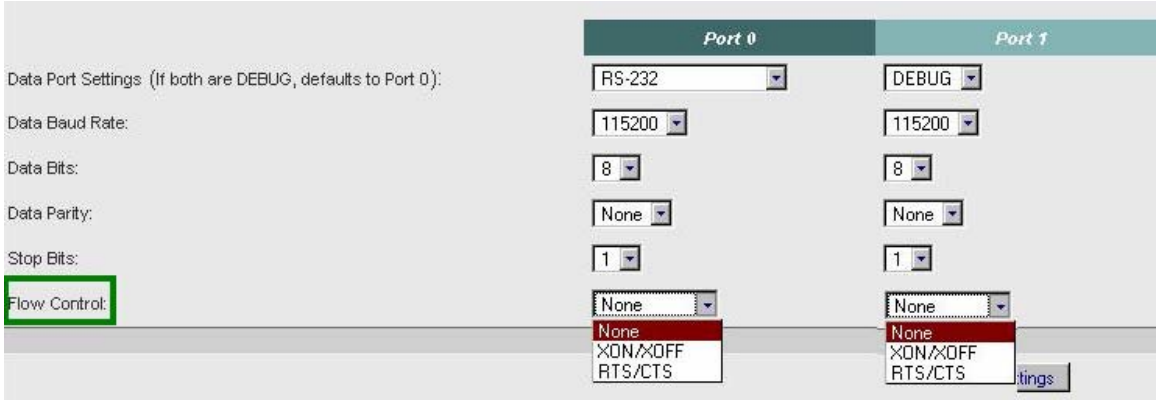
Select the appropriate **Data Parity** value from the drop down menu. This feature checks whether data has been lost or written over when transmitted between your host computer and your SB72EX (the recommended setting is **None**).

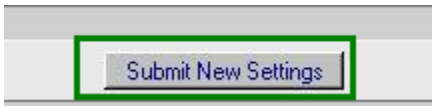


Select the appropriate **Stop Bits** value from the drop down menu. The stop bit follows the data and parity bits in serial communication. It indicates the end of transmission (the recommended setting is 1).



For **Flow Control**, the default setting is **None**. If you are using flow control, set this option appropriately.

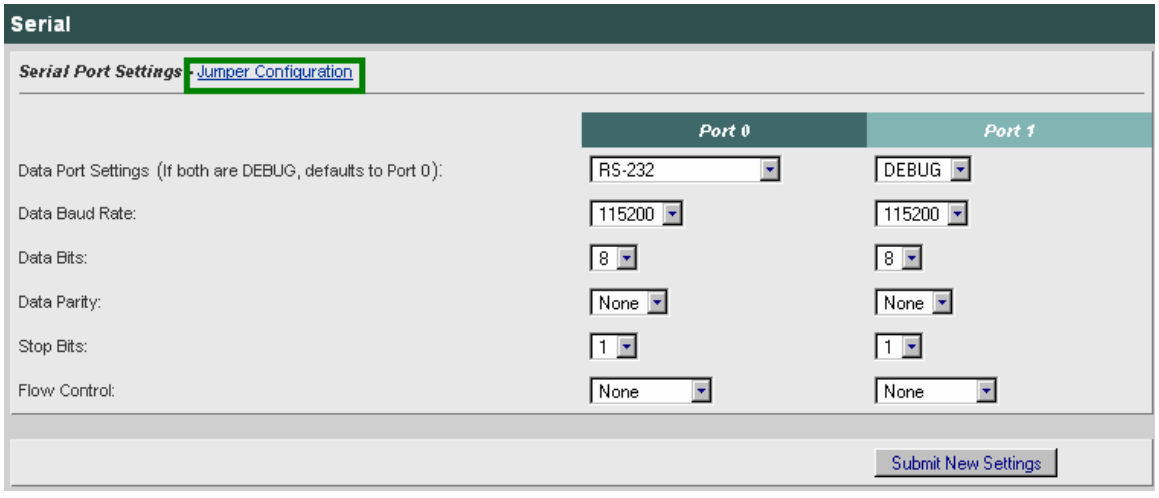




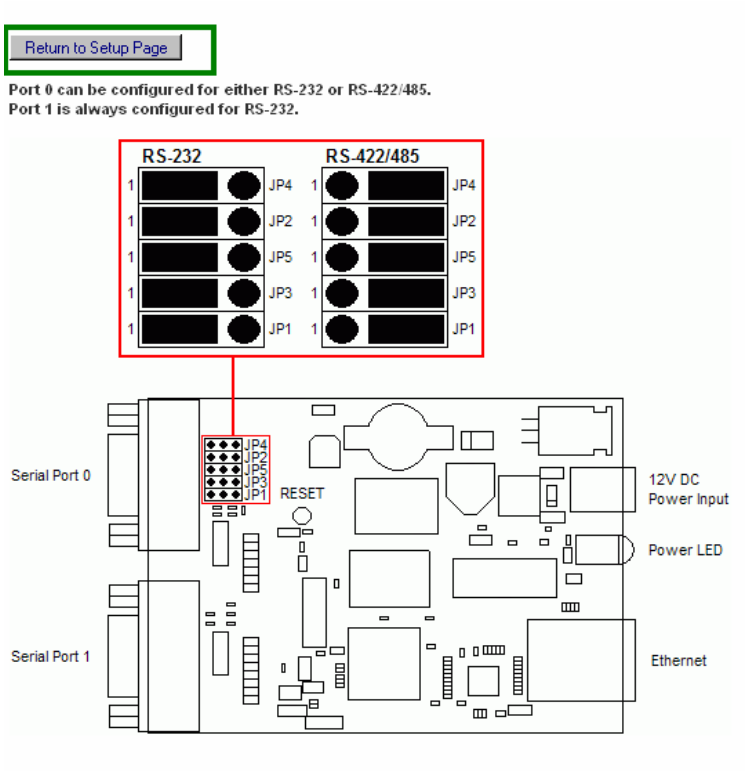
Note: You **must** click the **Submit New Settings** button on the bottom of this page to **save** your settings **Remember**, if you are only using one port, you can ignore the other port's section.

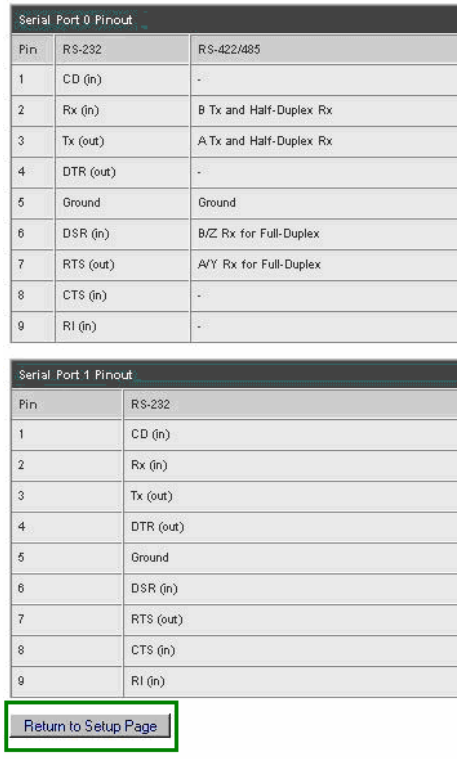
Jumper Configuration

Click the **Jumper Configuration** link on this page to view Port 0 and Port 1 jumper configuration and pinout information.



Note: To get back to the Serial section after viewing this page, click on the **Return to Setup Page** button directly above the SB72EX diagram.



SB72EX Pinout Information

Serial Port 0 Pinout

Pin	RS-232	RS-422/485
1	CD (in)	-
2	Rx (in)	B Tx and Half-Duplex Rx
3	Tx (out)	A Tx and Half-Duplex Rx
4	DTR (out)	-
5	Ground	Ground
6	DSR (in)	B/Z Rx for Full-Duplex
7	RTS (out)	A/Y Rx for Full-Duplex
8	CTS (in)	-
9	RI (in)	-

Serial Port 1 Pinout

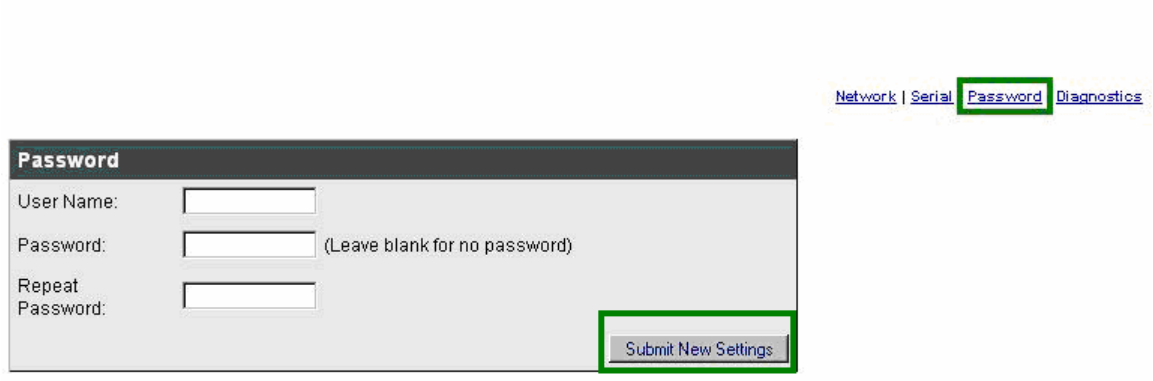
Pin	RS-232
1	CD (in)
2	Rx (in)
3	Tx (out)
4	DTR (out)
5	Ground
6	DSR (in)
7	RTS (out)
8	CTS (in)
9	RI (in)

Return to Setup Page

Click the **Return to Setup Page** button to return to the Serial section.

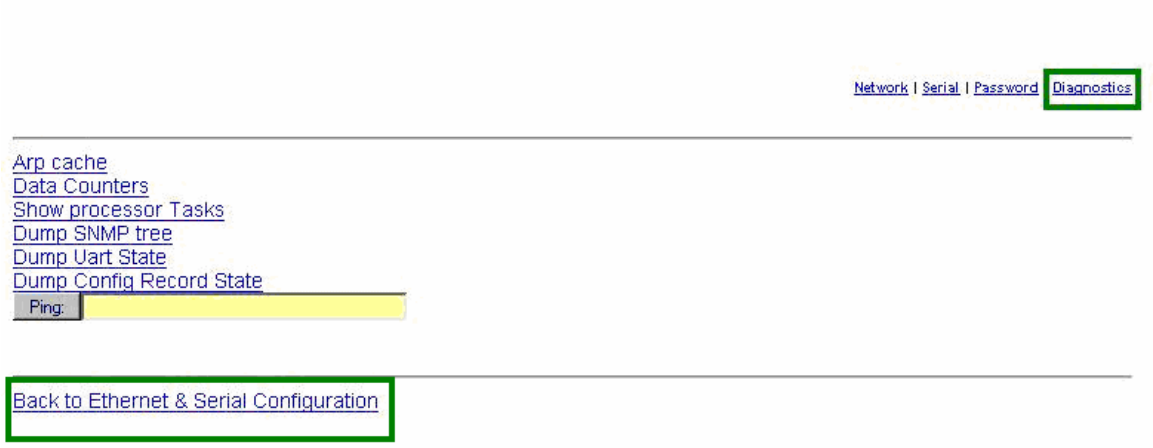
Password Setup Section

Click on the Password link to password protect your web server: Type in your user name, your password, confirm your password, and click the **Submit New Settings** button to save your user name and password.



Diagnostics Section

Click the **Diagnostics** link to view the available options. To get back to the Networking section, click the **Back to Ethernet & Serial Configuration** link.



Specifications

Input Power Requirements

Input Range: 7 – 30VDC
Suggested Power Source: 12VDC @ 500mA
Operating Range: Commercial 0 – 70C

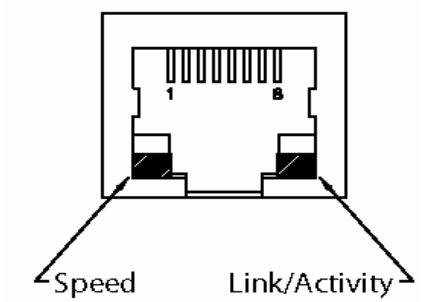
Power Connector

The power input is a standard 2.1mm P5 type input jack. The center is positive, and the outer shell in negative.

Pin	Signal
Center	7 – 30VDC
Shell	GND

LEDs

- Power LED: Illuminated while power is applied.
- LED1 on RJ-45: Ethernet speed - 10 or 100
- LED2 on RJ-45: Link and data activity

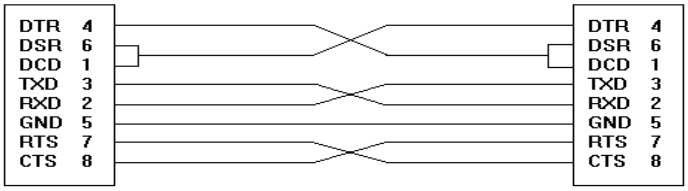


Mechanical

Dimensions: 4.1” x 3.125” x 1.0”

RS-232 NULL Modem Wiring

The following table and diagram shows how to create a null modem cable/adapter for RS-232 connections. **IMPORTANT:** A null modem cable is **required** if you are connecting your SB72EX to a single computer. A standard serial cable will **not** work!



Network IP Address Configuration

If you are part of an existing network, are not using DHCP, stop reading now, and go get a Static IP Address and Network Mask address from your network administrator. If you follow the advice in this paragraph on an existing network without an assigned Static IP Address, your Network Administrator will hunt you down....

IP Addresses are used to route packets from place to place on an Intranet/Internet. If you are **not** part of an established network, and your Ethernet segment is isolated, you can choose just about any IP Address you desire. The "powers that be" have actually set aside some addresses for isolated networks. They are documented in RFC1918. The reserved ranges are:

Class A: `10.0.0.0 to 10.255.255.255`
Class B: `172.16.0.0 to 172.31.255.255`
Class C: `192.168.0.0 to 192.168.255.255`

If you are doing development on an isolated network, you can use the following addresses:

- Set your host computer's Network Adapter Card IP Address to 10.1.1.10

Note: Only change the Network Adapter Card; do **not** change your Dial-Up Adapter settings.

- Set the Static IP Address of your SB72EX to 10.1.1.11
- Set the Network Mask address for both your host computer network and your SB72EX to 255.255.255.0

Web Browsers and Proxy Servers

If you are working on a corporate LAN that uses a proxy server for Internet web browsing, you will need to exclude the IP Address of your SB72EX in your web browser's proxy server settings/preferences. Otherwise, an attempt to connect to a web page on the LAN will **fail** because the proxy server will attempt to route the request outside the LAN. For most web browsers, this can be accomplished in the advanced settings for the proxy server configuration. Set the Network Mask for your host computer's network adapter and your SB72EX to 255.255.255.0.

Testing with a Telnet Connection

One quick way to test the functionality of your Serial-to-Ethernet connection is with the Telnet program and an RS-232 Serial terminal program (e.g. MTTTY). Remember you **must** use a NULL modem able to connect your SB72EX to your host computer. To run this test, configure your system as one of the two examples shown below:

The objective of this example is to use a single host computer running telnet and a serial terminal program to send data in either direction. Therefore, if you type text in the telnet window, it should appear in the serial terminal window and visa versa. For a serial terminal, you can use MTTTY (which is included in your NetBurner SB72EX CD-ROM) or HyperTerminal.

In the following example, an IP Address of **10.1.1.79** will be used for the SB72EX. **Note:** Replace this number with the **specific** IP Address you assigned (if using a Static IP Address) during configuration.

Procedure

1. Connect your hardware in one of the above configurations.

2. Open a command prompt window on your host computer.

3. Verify everything is connected correctly by executing the command **ping 10.1.1.79** and pressing the **Enter** key on your keyboard. You will see a valid ping response. **Remember** to substitute your IP Address for our example IP Address (i.e.10.1.1.79).

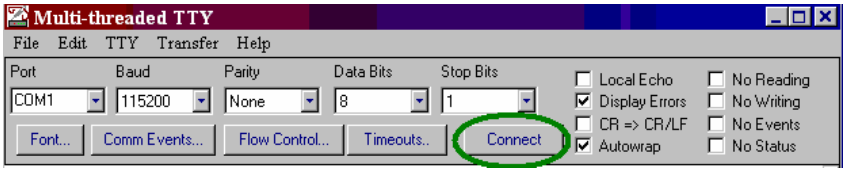
4. Run either HyperTerminal or MTTTY. Set the baud rate to the value you assigned to the SB72EX during configuration. To use MTTTY (with the factory default settings):

    - Connect your **NULL modem cable** from Port 0 on your SB72EX to your host computer's serial port. **Remember**, a standard serial cable will **not** work.

    - Run Mttty.exe (by double clicking its icon), which is located on the CD-ROM that came with your SB72EX. When the MTTTY window appears use the factory default setting shown below:

        - The **Port** setting is the communication port that you connected the NULL modem cable to on your host computer.
        - The host computer and the attached SB72EX must agree on a speed or **baud** rate to use for the serial connection.
        - **Parity** checks whether the data has been lost or written over when transmitted between your host computer and your SB72EX.
        - **Data Bits** are the number of bits in a transmitted data package.
        - The **Stop bit** follows the data and parity bits in serial communication. It indicates the end of transmission.

    - Click the MTTTY **Connect** button.



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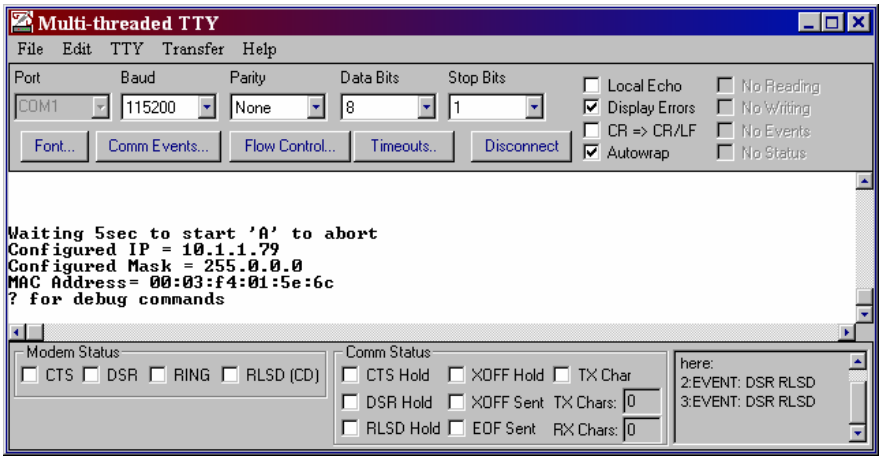
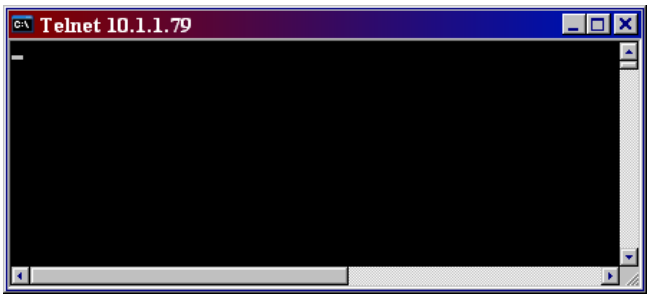
    - Remove and reapply power to your SB72 EX.

- The SB72EX factory application will boot.



5. Run Telnet by typing: telnet 10.1.1.79 **24** after the prompt, and press the **Enter** key. **Note:** This assumes a port number of **24**. You **must** replace this port number with the listening port number that you assigned in the "Device Connection Settings (TCP mode)" section. **Remember** to substitute your IP Address for our example IP Address (i.e.10.1.1.79).



6. At this point, anything you type in the Telnet window should appear in the serial terminal window and vice versa.